

Name: _____ Date: _____

Polynomial Factoring solution (version 39)

1. The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.

$$x^2 - 12x + 63 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-12) \pm \sqrt{(-12)^2 - 4(1)(63)}}{2(1)}$$

$$x = \frac{-(-12) \pm \sqrt{144 - 252}}{2(1)}$$

$$x = \frac{12 \pm \sqrt{-108}}{2}$$

$$x = \frac{12 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{12 \pm 6\sqrt{3}i}{2}$$

$$x = 6 \pm 3\sqrt{3}i$$

Notice that i is NOT under the square-root radical symbol!!

2. Express the product of $7 + 3i$ and $-6 - 2i$ in standard form $(a + bi)$.

Solution

$$(7 + 3i) \cdot (-6 - 2i)$$

$$-42 - 14i - 18i - 6i^2$$

$$-42 - 14i - 18i + 6$$

$$-42 + 6 - 14i - 18i$$

$$-36 - 32i$$

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3. Write function $f(x) = x^3 - 4x^2 - 20x + 48$ in factored form. I'll give you a hint: one factor is $(x + 4)$.

Solution

$$\begin{array}{c|cccc} & 1 & -4 & -20 & 48 \\ -4 & & -4 & 32 & -48 \\ \hline & 1 & -8 & 12 & 0 \end{array}$$

$$f(x) = (x + 4)(x^2 - 8x + 12)$$

$$f(x) = (x + 4)(x - 6)(x - 2)$$

4. Polynomial p is defined below in factored form.

$$p(x) = -(x + 4)^2 \cdot (x - 1) \cdot (x - 4)^2 \cdot (x - 7)$$

Sketch a graph of polynomial $y = p(x)$.

